

Researchers at the University of Crete have mapped a novel mechanism of carcinogenesis

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The research team of Prof George Zachos at the Department of Biology of the University of Crete has identified a novel mechanism that helps human cells detect tangled forms of DNA called “DNA bridges”, which can lead to cancer. Their discoveries, published in the *Journal of Cell Biology*, can pave the way for understanding the origins of carcinogenesis and help develop novel targeted approaches for cancer therapy.

<https://rupress.org/jcb/article-abstract/220/2/e202008029/211635/An-ATM-Chk2-INCENP-pathway-activates-the?redirectedFrom=fulltext>

During our life, the tiny cells in our body proliferate and each mother cell equally divides its DNA to the two daughter cells. This usually works fine however, sometimes the long threads of DNA inside our cells get tangled giving rise to “bridges” of DNA connecting the two daughter cells. Without support, these DNA bridges can break and lead to cancer formation. The researchers identified a novel signaling pathway comprising the MRN-ATM-Chk2-INCENP proteins that detects the presence of the tangled DNA and stops cell proliferation to prevent chromatin bridge-breakage.

Dr George Zachos, group leader of the “Cell Cycle and Division lab” and corresponding author of the study says: “Our results identify a basic mechanism that protects against carcinogenesis. Misregulation of this mechanism could be in the cause of several types of cancer”. Dr Eleni Petsalaki, main author of the study, adds: “Understanding the basics of carcinogenesis and identifying the protein molecules involved may help us develop more efficient, targeted approaches for cancer therapy in the near future”.

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